

## **REMARKS**

Claims 1-10, 36-37, and 59-67 stand rejected in the Office Action dated September 26, 2007. Claims 1-8 and 59-66 stand rejected under 35 U.S.C. §102. Claims 9, 10, 36, 37, and 67 stand rejected under 35 U.S.C. §103. Applicants propose amending claims 1, 36, and 59-68. Claims 11-15, 38-41 and 68 stand objected to. No claims were canceled or added. Therefore, following entry of the present response, claims 1-69 will be pending in the present application with claims 16-35, 42-58, and 69 withdrawn from consideration.

Applicants would like to thank the Examiner for indicating that claims 11-15, 38-41, and 68 are allowable if rewritten to include all of the limitations of the base claims. However, Applicants believe that claims 1, 36, and 59, from which claims 11-15, 38-41, and 68 depend, are allowable for the reasons described below.

### **Claim Rejections – 35 U.S.C. §102(b)**

Claims 1-8 stand rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Pub. No. 2001/0002441 (“Boveja”).

Applicants’ independent claim 1 recites a system for providing transcranial magnetic stimulation (TMS) treatment. As amended in claim 1, the system comprises a TMS coil for treating a patient using a magnetic field. A sensor is located between the TMS coil and a position on a patient where pulses are to be applied. The sensor detects the proximity of the TMS coil to the position and allows the TMS coil to be properly disposed with respect to the position.

The Office Action asserts that the coil in Boveja is fully capable of performing as a TMS coil and therefore anticipates claim 1. However, nowhere does Boveja teach or suggest the use of a coil for treatment of a patient using a magnetic field, as amended in the claims, much less for the recited treatment involving transcranial magnetic stimulation. Rather, Boveja sets forth the use of external and implantable coils as *proximity* sensing components, not *treatment* components (Boveja, paras. [0052]-[0053]). In particular, Boveja describes properly aligning external coil circuitry with implanted coil circuitry based on the direction and strength of a field applied from a magnet contained in the implanted coil to the external coil. Proper location of the coils is determined based on desired parameters of the field

measured from the magnet to the sensors. Thus, Boveja's coils are used for *placement* of the circuitry containing the coils, not for the *treatment* of the patient as recited in the claims.

In addition, Boveja's method of neuromodulation therapy used to treat urinary incontinence and urological disorders is accomplished via *electrical* stimulation, not by using a magnetic field as recited in the claims. Boveja describes neuromodulation therapy that uses a lead receiver implanted subcutaneously, and electrodes at the end of the receiver are positioned in a sacral nerve. Treatment is accomplished by *electrically* stimulating the electrodes at the end of the implanted receiver via an external stimulator, thus *electrically* stimulating the sacral nerve (Boveja, paras. [0050]-[0051]). Thus, Boveja's treatment is accomplished through *electrical* stimulation and does not teach the use of "a *transcranial magnetic stimulation* coil for treating a patient using a *magnetic* field." As described above, the magnetic field aspect described in Boveja is used for *placement*, not *treatment*.

Furthermore, Boveja does not teach a sensor that is disposed *between* a TMS coil and a position at which pulses are applied. Boveja's sensing components are *contained in* the coils and used at a distance apart (one implanted, one external) (Boveja, [0052]-[0053], *also see* sensor component 50 in FIGs. 7, 8). Thus, Boveja does not teach a sensor that is "disposed *between* the coil and a position at which pulses are applied."

Therefore, because Boveja does not disclose the features recited in claim 1, Applicants respectfully submit that Boveja does not anticipate claim 1. As claims 2-8 depend from claim 1, Applicants further respectfully submit that claims 2-8 patentably define over the references as applied.

Accordingly, Applicants respectfully submit that the present claims patentably define over the cited reference and requests withdrawal of the rejection of claims 1-8 under 35 U.S.C. 102(b).

### **Claim Rejections – 35 U.S.C. §102(e)**

Claims 59-66 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Pub. No. 2004/0193002 ("Tanner").

Claim 59 recites a method of providing transcranial magnetic stimulation (TMS) to a patient that includes detecting the proximity of a TMS coil to a position at which pulses are to be applied to the TMS coil during TMS treatment. Applicants note that claim 59 recites that

the sensor detects proximity of a TMS coil with the position, and the sensor is located between the TMS coil and that position. Applicants submit that claim 59 is not anticipated by Tanner as alleged by the Office Action.

In particular, Tanner does not teach claim 59, as amended, that recites a sensor that is located *between* said TMS coil and the position at which pulses are to be applied. Rather, Tanner teaches a simulated model of a head structure and a simulated model of an induction device's magnetic field. Both models may be generated before the induction device is placed near the head (Tanner, FIG. 6). Then, the coordinates of the simulation models may be matched such that the induction device can be arranged relative to the brain (Tanner, [0010]; [0040]). But the simulation models do not include a sensor disposed between the TMS coil and a position on the head.

Furthermore, the markers described in Tanner that are placed on the head and on the induction device (Tanner, [0014]) are not sensors that detect proximity of a TMS coil to the position as suggested by the Office Action. Rather, in Tanner, the matching of the spatial coordinates generated by the simulation models, not a sensor, is what portrays the proximity of the induction device to the head. The markers merely provide inputs to the respective simulation models. *Id.*

For example, the markers described in Tanner may be placed on the head and the person may move around the room. The simulated head model can use the movement of the markers to update the positioning of the modeled spatial structure of the head as it moves around the room. These moving spatial coordinates may then be matched to the coordinates of a simulated induction device position. But, without these markers, the spatial coordinates of the models may still be generated and matched to portray the proximity of the induction to the device to the head. *Id.* Thus, the markers provide inputs to the respective simulation models, but they are not the sensors that detect the proximity between the TMS coil and position on the head. Furthermore, nowhere do the simulated models or the markers in Tanner teach the detection of proximity between the TMS coil and the position on the patient.

Applicants note that Tanner describes the use of the simulation models for TMS since proper positioning of a device to the head may be determined by relative spatial relationships (Tanner, [0012]). However, the claimed method uses a *sensor* to detect the proximity of the

TMS coil to a position on the head rather than by detecting proximity by *matching the coordinates* of simulation models.

Therefore, because Tanner fails to disclose a sensor disposed between the TMS coil and the position at which pulses are to be applied, where the sensor detects proximity of the TMS coil to the position, Applicants respectfully submit that Tanner does not anticipate claim 59. As claims 60-66 depend from claim 59, Applicants further respectfully submit that claims 60-66 patentably define over the references as applied.

Accordingly, Applicants respectfully submit that the present claims patentably define over the cited reference and requests withdrawal of the rejection of claims 59-66 under 35 U.S.C. 102(e).

### **Claim Rejections – 35 U.S.C. §103(a)**

#### **Claims 9 and 36**

Claims 9 and 36 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Pub. No. 2001/0002441 (“Boveja”). The Office Action alleges that Boveja does not expressly disclose that the sensor is disposed in a flexible substrate and it would have been an obvious matter of design choice to a person of ordinary skill in the art to use a flexible substrate.

Independent claim 36 recites a sensor disposed on a flexible substrate that is disposed “between said TMS coil and said position,” and “detects proximity of said TMS coil with said position,” which is similar to the features of claim 1, including amendments, discussed above in view of Boveja. Applicants submit that claim 36 is in proper form for allowance for at least the same reasons as discussed above regarding claim 1.

Claim 9 depends from independent claim 1. Because claim 1 is in proper form for allowance based on the foregoing reasons, Applicants submit that claim 9 is therefore allowable.

Accordingly, Applicants respectfully submit that the present claims patentably define over the cited reference and requests withdrawal of the rejection of claims 9 and 36 under 35 U.S.C. 103(a).

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**PATENT**

**Claims 10 and 37**

Claims 10 and 37 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Pub. No. 2001/0002441 (“Boveja”) in view of U.S. Pub. No. 2004/0167592 (“Grove”). Claims 10 and 37 depend, either directly or indirectly, from independent claims 1 and 36. Based on the foregoing reasons for allowability of claims 1 and 36, Applicants submit that claims 1 and 36 are likewise in condition for allowance.

Accordingly, Applicants respectfully submit that the present claims patentably define over the cited reference and requests withdrawal of the rejection of claims 10 and 37 under 35 U.S.C. 103(a).

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**PATENT**

### **CONCLUSION**

For the foregoing reasons, Applicants respectfully submit that all of the claims of the present application patentably define over the prior art of record. Reconsideration of the Office Action and a Notice of Allowance are respectfully requested. In the event that the Examiner cannot allow the present application for any reason, the Examiner is encouraged to contact the undersigned attorney, Lori Swanson at (215) 564-8997 to discuss the resolution of any remaining issues.

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